

## MUSCARDINUS.

Although recorded from Andalucia by Machado and Reguera, and included in an anonymous list of rodents from N.W. Spain \*, this genus has, in fact, not yet been found in the Peninsula. Graells rightly doubted its existence in Spain, while Seabra does not record it in Portugal. All the specimens I have seen in Spanish collections are from France, Germany, or Italy.

XXXI.—*Eighteen new European Voles.*

By GERRIT S. MILLER.

AMONG the European voles in the collection of the British Museum are specimens of the following new forms.

*Evotomys cesarius*, sp. n.

*Type*.—Adult male (skin and skull). B.M. no. 3. 2. 11. 2. Collected at St. Helier, Jersey, Channel Islands, January 2, 1896, by Capt. G. E. H. Barrett-Hamilton. Presented by the collector.

*Characters*.—A member of the *nageri* group, agreeing with *E. skomerensis* in the presence of a well-defined third reentrant angle on inner side of third upper molar, but differing from the Skomer vole in the shorter, more evenly cuneate nasals (in this respect resembling *E. nageri*, *E. vasconicæ*, and *E. norvegicus*), broader rostrum, shorter tail (45 to 49 mm. instead of 53 to 59 mm.), and much darker colour (upperparts a rich, dark reddish brown approaching the cinnamon-rufous of Ridgway, but not so vivid, the sides lighter and suffused with dull buff, though not sufficiently to produce any marked contrast with back; underparts a clear rich buff, between the buff and cream-buff of Ridgway; tail sharply and conspicuously bicolor, blackish above, concolor with belly below; feet a dusky grey above, rather dark hair-brown on furred portion of sole).

*Measurements*.—Type. Head and body 96 mm. (97) †; tail 49 (45); hind foot 18 (19); ear from meatus 11 (10). Skull:

\* The list, attributed to Señor J. Alonso Lopez by Seoane, is found in a book entitled 'Consideraciones generales sobre varios puntos á favor de la libertad y fomento de los pueblos,' 1820, vol. ii. p. 115.

† Measurements in parentheses are those of a second specimen from the type locality (♂ ad., B.M. no. 3. 2. 11. 1).

condylo-basal length 25.6; zygomatic breadth 14 (14); interorbital constriction 4.0 (4.0); occipital breadth 11.6; occipital depth (median) 7.0; nasal 7.0 (7.0); diastema 7.2 (7.0); mandible 15.4 (15.2); maxillary tooth-row 6.2 (6.2); mandibular tooth-row 6.0 (6.0).

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—In general appearance the Jersey red-backed vole resembles the richly coloured *Evotomys hercynicus rubidus* of the adjacent French mainland (two specimens examined from Dinan, Côtes-du-Nord, collected by Capt. Barrett-Hamilton), though the large size of its skull and the peculiarities of the third upper molar at once show its relationship with *E. skomerensis*. In the Skomer vole, however, the general colour above is much lighter, approaching the orange-rufous of Ridgway, though less red, and the underparts are a conspicuously contrasted whitish grey with only a faint buffy tinge. The feet are also whitish, much paler than in the Jersey animal, both above and on hind part of sole.

#### *Arvicola sapidus*, sp. n.

*Type*.—Adult female (skin and skull). Collected at Santo Domingo de Silos, Province of Burgos, Spain, October 7, 1906, by G. S. Miller. Original number 7216.

*Characters*.—Size large, as in the British *Arvicola amphibius* (hind foot 33 to 37 mm.; condylo-basal length of skull in adults 42 to 44.4 mm.), but skull with nasals very broad, the greatest breadth of both together nearly equal to anterior rostral breadth, and colour, as in the small Italian *A. musignani*, conspicuously buffy (upperparts between ochraceous-buff and clay-colour often tinged with russet, strongly "lined" with black along middle of back, nearly clear on sides; underparts light ochraceous-buff clouded by the grey (Ridgway no. 6) under colour; feet drab-grey; tail brownish, lighter below than above).

*Measurements*.—Type. Head and body 187 mm.; tail 123; hind foot 34; ear from meatus 18. Skull: condylo-basal length 42 (44.4)\*; zygomatic breadth 23.4 (25); interorbital constriction 4.4 (4.4); occipital breadth 17 (18.6); occipital depth (median) 11 (13); nasal 11.6 (13); diastema 13.4 (14.8); mandible 28 (29.4); maxillary tooth-row 10.6 (10.8); mandibular tooth-row 10.8 (11).

\* Measurements in parentheses are those of the largest skull examined (♂, Barracas, Province of Castellon, Spain, March 10, 1907, Norberto Gonzalez. Original number 134).

*Specimens examined.*—One hundred and nine from the following localities in Spain:—La Coruña, Coruña, 2; Pájaros, Leon, 6; Arrechavaleta, Vitoria, 1; Santo Domingo de Silos, Burgos, 20; Jaca, Huesca, 6; Panticosa, Huesca, 25; Lerida, Lerida, 13; Barracas, Castellon, 12; Silla, Valencia, 1; Villalba, Madrid, 2; Bejar, Salamanca, 1; Seville, Seville, 6; Coria del Rio, Southern Spain, 2; near Tarifa, Gibraltar, 1; Venta de Baul (between Guadix and Baza), Granada, 1.

*Remarks.*—The Iberian water-rat is well differentiated from its allies by the combination of large size, buffy coloration, and broad nasal bones. In two fully adult topotypes of *Arvicola musignani* the skull is much smaller, length from front of nasal to back of interparietal 32 and 34 mm. as compared with 37 and 40.4 mm. in the type of *sapidus* and the large male from Barracas. While the size of *Arvicola amphibius* is about equal to that of the Spanish animal, the British form shows no tendency toward buffy coloration, and the nasal bones are very narrow, their greatest combined breadth noticeably less than anterior rostral breadth.

*Arvicola tenebricus*, sp. n.

*Type.*—Adult male (skin and skull). B.M. no. 6. 1. 21. 5. Collected three miles east of Biarritz, Basses Pyrénées, France, December 30, 1905, by J. F. Davison, Esq. Original number 7. Presented by the collector.

*Characters.*—Like *Arvicola sapidus*, but coloration dark and brownish, in strong contrast with the buffy tints of the Spanish animal (upperparts a dull greyish buff, so heavily overlaid with black that the general effect is not far from a rather light, grizzled bister on back, and a greyish wood-brown on sides; underparts slaty grey, washed with light ochraceous-buff on chest and belly; feet hair-brown; tail blackish above, greyish below, not distinctly bicolor).

*Measurements.*—Type. Head and body 193 mm.; tail 112; hind foot 34; ear 17. Skull: condylo-basal length, 41.6; zygomatic breadth 24; interorbital constriction 4.4; occipital breadth 17.8; occipital depth 10.4; nasal 12; diastema 13; mandible 26.8; maxillary tooth-row 10.6; mandibular tooth-row 10.2.

*Specimens examined.*—Eleven, from the following localities: vicinity of Biarritz, Basses Pyrénées, 7; l'Hospitalet, Ariège, 2; Porté, Pyrénées Orientales, 2.

*Remarks.*—The Pyrenean water-rat resembles *Arvicola*

*amphibius* and *A. terrestris* in colour, but is readily distinguishable from the northern forms by its broad nasals. With the material at hand there are no apparent characters to distinguish the Biarritz specimens from those taken in Ariège and the Pyrénées Orientales at altitudes of about 4800 feet.

*Microtus arvalis meridianus*, subsp. n.

*Type*.—Adult female (skin and skull). B.M. no. 6.6.4.26. Collected at Biarritz, Basses Pyrénées, France, April 13, 1906, by J. F. Davison, Esq. Original number 30. Presented by the collector.

*Characters*.—Similar to *Microtus arvalis arvalis* of Central and Northern Germany, but coloration much more buffy (upperparts a finely grizzled yellowish brown, the general effect something between wood-brown and a very light bister; underparts as in true *arvalis*, but with a more evident buffy wash; feet buffy white; tail not sharply bicolor, dark brownish above, buffy white below).

*Measurements*.—*Type*. Head and body 115 mm.; tail 32; hind foot 16; ear from meatus 12. Skull: condylo-basal length 25.4; zygomatic breadth 15; interorbital constriction 3.0; occipital breadth 11; occipital depth (median) 6.0; nasal 7.2; diastema 8.0; mandible 16.2; maxillary tooth-row 6.4; mandibular tooth-row 6.4.

*Specimens examined*.—Seven, all from the type locality.

*Microtus levis*, sp. n.

*Type*.—Adult male (skin and skull). B.M. no. 4.4.6.55. Collected at Gageni, Roumania, April 25, 1899, by W. Dodson. Original number 67. Presented by the late Lord Lilford.

*Characters*.—Externally as in *Microtus arvalis* of Central and Northern Germany; skull differing from that of true *M. arvalis* in greater length (condylo-basal length usually more than 26 mm. instead of 24 to 25.6 mm.) and less relative breadth (ratio of zygomatic breadth to condylo-basal length about 50 instead of about 55), much longer narrower brain-case (distance from interorbital constriction to condyle decidedly greater than zygomatic breadth), more inflated audital bullæ, and in the smoothly rounded interorbital region, which, together with sides of brain-case, apparently never develops distinct ridges; teeth as in *M. arvalis*.

*Measurements*.—*Type*. Head and body 110 mm.; tail 38;

hind foot 17.5; ear from meatus 11. Skull: condylo-basal length 26.6 (25)\*; zygomatic breadth 14.4 (14.4); distance from interorbital constriction to back of condyle 15.4 (14); interorbital constriction 3.4 (3.2); occipital breadth 12.2 (11.4); occipital depth (median) 6.6 (6.8); palatal depth 8.0 (7.8); nasal 7.8 (7.4); diastema 8.0 (7.4); mandible 16.6 (15.8); maxillary tooth-row 6.4 (5.8); mandibular tooth-row 6.2 (5.8).

*Specimens examined.*—Seventeen, all from the type locality.

*Microtus angularis*, sp. n.

*Type.*—Adult male (in alcohol). B.M. no. 80.10.28.2. Collected in Transylvania (probably near Hatszeg, Hunyad, Hungary) by C. G. Danford, Esq. Presented by the collector.

*Characters.*—A large member of the *Microtus arvalis* group, about equal to the Grecian *M. hartingi* in size, but with much longer tail (about 40 mm. instead of 24 to 27 mm.). Skull peculiar in the very short, deep rostrum (depth at back of nasal noticeably greater than distance between front of zygoma and anterior extremity of nasal) and the unusually conspicuous angle (about 34° instead of about 18° to 22° as in *M. arvalis*, *M. hartingi*, and *M. orcadensis*) at which the nasals slope downward; audital bullæ relatively larger than in *M. arvalis*, but not so strongly inflated as in *M. hartingi*. Teeth with pattern of enamel-folding as in *Microtus arvalis*, but all of the triangles, especially those of lower molars, with transverse diameter noticeably increased and area of dentine spaces reduced. Colour apparently as in *M. arvalis*.

*Measurements.*—Head and body 115 mm.; tail 41; hind foot 18; ear from meatus 12. Skull: condylo-basal length 27 (ca.)†; zygomatic breadth 16.4 (ca.); interorbital breadth 4.0 (ca.); occipital breadth 13; occipital depth 7.6 (ca.); nasal 8.0; diastema 8.4; mandible 17.4 (ca.); maxillary tooth-row 6.6; mandibular tooth-row 6.4.

*Specimen examined.*—The type.

*Microtus asturianus*, sp. n.

*Type.*—Adult female (skin and skull). Collected at

\* Measurements in parentheses are those of an old male *Microtus arvalis* from Königsberg, Germany (no. 112213, U.S. National Museum).

† Certain measurements of the badly broken skull were taken before cleaning, while the fragments were still in approximately normal position.

Pájares, Leon, Spain, June 23, 1907, by Norberto Gonzalez. Original number 321.

*Characters*.—Larger than *Microtus arvalis*, the skull massive and deep, with strongly convex dorsal profile, widely spreading zygomata, short, broad brain-case, strongly ridged interorbital region, and very large audital bullæ; teeth as in *M. arvalis*; colour about as in the more buffy forms of *M. arvalis* (upperparts buffy clay-colour, rather coarsely "lined" with black along median dorsal area, clearer and more nearly approaching ochraceous-buff on sides; underparts dull grey, clear or washed with light buff; feet an indefinite buffy grey tinged with drab, not conspicuously different from colour of back; tail obscurely bicolor, buffy grey below, brownish mixed with grey above).

*Measurements*.—Type. Head and body 120 mm.; tail 37; hind foot 20\*; ear 14. Skull: condylo-basal length, 26.2; zygomatic breadth 15.2; distance from interorbital constriction to back of condyle 15; interorbital constriction 3.2; occipital breadth 12.2; occipital depth (median) 6.4; palatal depth 8.6; na-al 7.8; diastema 7.8; mandible 16.6; maxillary tooth-row 6.6; mandibular tooth-row 6.4.

*Specimens examined*.—Three, all from the type locality.

*Remarks*.—In its large, massive skull *Microtus asturianus* differs conspicuously from its nearest geographical ally, *M. arvalis meridianus* of the Basses-Pyrénées region. Its strongly convex dorsal outline gives the skull a superficial resemblance to that of *M. cabreræ* of the Sierra de Guadarrama, but the nasal bones are strictly of the *arvalis* type. The size and massiveness of the skull are so great as to suggest a small *Microtus orcadensis*, but it is scarcely probable that any direct relationship is indicated by this resemblance.

*Microtus sandayensis westræ*, subsp. n.

*Type*.—Adult male (skin and skull). B.M. no. 8.1.2.1. Collected at Puriswall, Westray, North Orkney Islands, April 5, 1906, by Norman B. Kinnear, Esq. Original number 290. Presented by the collector.

*Characters*.—Size and cranial characters as in *Microtus sandayensis sandayensis* (Millais), but first lower molar with anterior outer re-entrant angle occasionally (in 2 specimens among 6) as well developed as in *M. orcadensis*; colour not so pale as in the Sanday vole, the underparts strongly washed with yellowish brown (general effect above a dark hair-brown

\* Collector's measurement. In the prepared specimen the hind foot (slightly distorted) after relaxing measures 19.4 mm.

approaching bister, the arrangement of colour as in *M. sandayensis sandayensis*, but light tips to hairs of underfur more nearly dull ochraceous-buff, and dark shading from longer hairs more noticeable; underparts light ochraceous-buff, nearly as in *M. orcadensis*, but colour not so rich, and clouding due to slaty bases of hairs more evident; feet and tail as in true *sandayensis*, but sprinkling of dark hairs on upper side of tail more conspicuous).

*Measurements.*—Type. Head and body 108 mm.; tail 34; hind foot 18; ear from meatus 10.5. Skull: condylo-basal length 27.2; zygomatic breadth 16.2; interorbital constriction 3.6; occipital breadth 12; occipital depth (median) 6.4; nasal 7.8; diastema 8.2; mandible 17.4; maxillary tooth-row 6.6; mandibular tooth-row 6.8.

*Specimens examined.*—Seven, all from Westray Island, kindly placed at my disposal by Mr. Kinnear.

*Remarks.*—The voles of the North Orkney Islands differ from those of the southern group in their smaller size, lighter colour, and in the peculiar low, flattened form of the braincase. In typical *Microtus sandayensis* the first lower molar invariably (12 specimens) differs from that of *M. orcadensis* (53 specimens) in the shallowness of the anterior outer re-entrant angle, which is much less developed than that of the inner side (in *M. orcadensis*, as in the continental members of the *arvalis* group, the two angles are approximately equal). Four specimens of *M. s. westrae* have this aberrant type of tooth, while in two the angles are of normal depth. The colour is less pallid than in the typical form, though not so dark as in *M. orcadensis*.

The degrees of distinctness of the Orkney voles among themselves appear to bear a direct relation to the depth of water separating the islands, and therefore presumably to the length of time that the different colonies have been isolated. Specimens of *M. orcadensis* showing no indication of the existence of local forms on the various islands have been examined from Rousay, Pomona, Shapinshay, and South Ronaldshay, the channels separating which range from 6 to 8 fathoms in depth. Between the islands inhabited by this species and those occupied by *M. sandayensis* lies a narrow but comparatively deep strait, with 17 to 20 fathoms of water. Finally, between Sanday and Westray, with their different, though not completely segregated forms, the depth of the water is intermediate, 10 to 12 fathoms.

*Microtus agrestis exsul*, subsp. n.

*Type*.—Adult female (skin and skull). B.M. no. 6. 3. 1. 3. Collected on North Uist, Hebrides, February 5, 1906, by J. F. Davison, Esq. Presented by the collector.

*Characters*.—In general like the large Scandinavian *Microtus agrestis agrestis*, but underparts with more evident brownish wash, often becoming a clear rather light ochraceous-buff; first upper molar with small third inner triangle usually present (in 10 among 14 specimens) and almost as well developed as second inner triangle of middle molar.

*Measurements*.—Type. Head and body 123 mm.; tail 44; hind foot 19; ear from meatus 12. Skull: condylo-basal length 28; zygomatic breadth 15·8; interorbital constriction 3·2; occipital breadth 12; occipital depth 6·6; nasal 8·0; diastema 8·2; mandible 18; maxillary tooth-row 7·0; mandibular tooth-row 7·0.

*Specimens examined*.—Fourteen, eleven from North Uist and three from South Uist, Hebrides\*: all but three lent by (Mr. Kinnear. An immature male from Kildalton, Islay No. 392, Kinnear collection), appears to represent the same form, but is too young to be positively identified.

*Remarks*.—A supplemental triangle in the first upper molar, similar to that usually present in *Microtus agrestis exsul*, occurs in 4 among 32 specimens of true *agrestis* and in only 2 among 48 British mainland skulls. The cranial characters of fully adult individuals of the Hebridean vole as compared with true *agrestis* and the common British form are well indicated by the following table (in mm.) :—

	Number of skulls.	Condylo- basal length.	Mandible.	Upper tooth-row.	Lower tooth-row.
<i>agrestis</i> ..	9	26·4 to 28·4	16·6 to 18	6·6 to 7·0	6·2 to 6·6
<i>exsul</i> ....	7	27 to 28	17 to 18	6·8 to 7·0	6·4 to 7·0
<i>neglectus</i> ..	13	25 to 26	15·4 to 16·2	5·8 to 6·4	5·8 to 6·2

The discovery of this vole is of unusual interest, as the probable existence of some such animal in North Britain was pointed out several months ago †, at a time when the characters of the Hebridean form were unknown.

\* Mr. Kinnear has called my attention to the fact that no voles have yet been found on the island of Lewis, the largest of the Outer Hebrides.

† Stejneger, Smithsonian Miscell. Coll. xlviii. p. 478 (May 4, 1907).



*Pitymys subterraneus capucinus*, subsp. n.

*Type*.—Adult female (skin and skull). Collected in spruce-forest near "Salon du Capucin," Mont Dore, Puy de Dôme, France (altitude about 4200 feet), August 2, 1906, by G. S. Miller. Original number 7002.

*Characters*.—Similar to *Pitymys subterraneus subterraneus*, but skull larger, brain-case broader and more flattened, and colour not so dark (general effect above approaching mars-brown, but with a slight buffy cast; feet a clear, very pale smoke-grey, noticeably contrasting with colour of back).

*Measurements*.—Type. Head and body 102 mm.; tail 33; hind foot 15. Skull: condylo-basal length 23.4 (22)\*; zygomatic breadth 13.8 (13); interorbital constriction 3.8 (3.8); occipital breadth 11.2 (10.8); breadth of brain-case under zygoma 10.8 (9.6); occipital depth (median) 5.4 (5.6); nasal 6.4 (6.0); diastema 7.0 (6.8); mandible 14.8 (13.8); maxillary tooth-row 5.8 (5.2); mandibular tooth-row 5.6 (5.2).

*Specimens examined*.—Two, both from the type locality.

*Pitymys dacius*, sp. n.

*Type*.—Adult female (skin and skull). B.M. no. 4. 4. 6. 65. Collected at Gageni, Roumania, April 25, 1899, by W. Dodson. Original number 65. Presented by the late Lord Lilford.

*Characters*.—Similar to *Pitymys subterraneus*, but skull larger, nasals more strongly bent downward anteriorly, brain-case more depressed posteriorly (the dorsal profile of skull thus made slightly convex throughout); posterior upper molar with third inner re-entrant angle very shallow; colour indistinguishable from that of *P. subterraneus* in the usual hair-brown phase.

*Measurements*.—Type. Head and body 88 mm.; tail 32.5; hind foot 14.5; ear from meatus 8.5. Skull: condylo-basal length 23; zygomatic breadth 13.6; interorbital constriction 3.8; occipital breadth 10.8; breadth of brain-case under zygomata 10; occipital depth (median) 5.0; nasal 5.8; diastema 7.0; mandible 15; maxillary tooth-row 5.6; mandibular tooth-row 5.8.

*Specimen examined*.—The type.

*Remarks*.—Although represented by a single specimen

\* Measurements in parentheses are those of an adult male *M. subterraneus subterraneus* from Belgium (No. 2189, Lataste collection).

only, this species appears to be well characterized by the convex dorsal profile of the skull and the very shallow third re-entrant angle on inner side of posterior upper molar, features which are not closely approximated in a considerable series of *P. subterraneus* from Belgium, France, Switzerland, and the Transylvanian Alps.

*Pitymys pyrenaicus brunneus*, subsp. n.

*Type*.—Adult female (skin and skull). B.M. no. 6. 4. 1. 82. Collected in the Forest of Bouconne, Gers, France (altitude 250 m.), February 4, 1900, by A. Robert. Presented by O. Thomas, Esq.

*Characters*.—Similar to *Pitymys pyrenaicus pyrenaicus*, but colour much more brownish, the upperparts a light, dull, faintly grizzled wood-brown, with scarcely a trace of the bistre and clear hair-brown tints characteristic of the typical form.

*Measurements*.—Type. Head and body 93 mm.; tail 26; hind foot 15; ear from meatus 8. Skull: condylo-basal length 23; zygomatic breadth 14; interorbital constriction 4.0; occipital breadth 11; occipital depth (median) 5.6; palatal depth 6.2; nasal 6.0; diastema 7.0; mandible 15; maxillary tooth-row 5.8; mandibular tooth-row 5.8.

*Specimens examined*.—Seven, all from the type locality.

*Remarks*.—This appears to be a well-defined local race of *Pitymys pyrenaicus*, as the seven skins differ without exception from the eleven Pyrenean specimens with which they have been compared. Its geographical range will probably be found to extend over the low country lying between the Pyrenees and the Gironde.

*Pitymys planiceps*, sp. n.

*Type*.—Adult (skull only). No. 2190, Lataste collection. Barèges, Hautes-Pyrénées, France. Altitude about 4000 feet.

*Characters*.—Size about as in *Pitymys pyrenaicus*; teeth as in that species, *P. savii*, &c.; skull more flattened than in any other known European member of the genus, the dorsal profile nearly straight from posterior extremity of nasal to back of interparietal, the general outline when viewed from above essentially as in *P. pyrenaicus* and *P. savii*.

*Measurements*.—Condylo-basal length 23 (23); zygomatic breadth 14 (13.8); interorbital constriction 3.8 (3.8); occipital breadth 11.4 (11.4); occipital depth 5.4 (6.0); palatal depth 6.2 (6.8); nasal 6.0 (6.2); diastema 7.0 (7.0);

mandible 14.6 (15); maxillary tooth-row 5.6 (5.6); mandibular tooth-row 5.6 (5.6).

*Remarks.*—The characters of the skull on which this species is based are so peculiar that it seems necessary to recognize the animal as distinct. In September 1906 I visited Barèges chiefly for the purpose of securing further specimens of *Pitymys planiceps*, but though colonies of *P. pyrenaicus* were readily found in the forest above the town, I failed in the main object of my search.

*Pitymys pelandonius*, sp. n.

*Type.*—Adult female (skin and skull), collected at Santo Domingo de Silos, Province of Burgos, Spain (altitude 980 m.), October 21, 1906, by G. S. Miller. Original number 7382.

*Characters.*—Similar to *Pitymys marie*, Major, but skull with broader, less elongate brain-case; general colour of upperparts wood-brown, the sides somewhat more buffy; feet and tail whitish.

*Measurements.*—Type. Head and body 96 mm.; tail 28; hind foot 14.4; ear from meatus 8.4. Skull: condylo-basal length 22 (22)\*; zygomatic breadth 14 (13); occipital breadth 10.6 (9.8); breadth of brain-case under zygomata 10.2 (9.6); occipital depth (median) 5.6 (5.0); palatal depth 6.8 (6.4); nasal 6.0 (6.0); diastema 6.6 (6.6); mandible 14.4 (14); maxillary tooth-row 5.4 (5.6); mandibular tooth-row 5.6 (5.4).

*Specimens examined.*—Five, three from the type locality and two from Castrillo de la Reina, Province of Burgos.

*Remarks.*—At both Silos and Castrillo this animal occurs in rocky ground partly overgrown with shrubs and small trees. Its habits are essentially the same as those of *Pitymys subterraneus* or *P. pyrenaicus*, and much less mole-like than those of the meadow-haunting *P. ibericus*.

*Pitymys depressus*, sp. n.

*Type.*—Adult female (in alcohol). B.M. no. 6. 11. 4. 15. Collected at Rascafria, south side of Sierra de Guadarrama, Province of Madrid, Spain, by M. de la Escalera.

*Characters.*—A member of the *Pitymys duodecimcostatus* group†, related to *P. lusitanicus*, *P. marie*, and *P. pelandonius*, but immediately recognizable by its broadened, much flattened

\* Measurements in parentheses are those of the type (adult female) of *Pitymys marie*.

† See Major, Ann. & Mag. Nat. Hist. 7th ser. xv. pp. 508-510 (May 1905).

skull and very small audital bullæ. Viewed from the side the skull is as flat as that of *Pitymys savii*; dorsal profile slightly but evenly convex, the nasals not so abruptly sloping as usual; rostrum excessively shallow immediately behind nasals, its least depth barely exceeding greatest combined breadth of nasals; length of brain-case to posterior edge of interparietal barely equal to breadth under zygomata, the general outline subcircular; occipital region oblique posteriorly, so that condyles are plainly visible when skull is viewed from above, very low and wide in posterior view; audital bulla very small and low, the greatest diameter contained about four times in condylo-basal length of skull (about three to three and one half times in *lusitanicus*, *marixæ*, and *pelandonius*); teeth as in the related species; external characters apparently showing no special peculiarities.

*Measurements*.—Type. Head and body 85 mm.; tail 25; hind foot 13; ear from meatus 8. Skull: condylo-basal length 22.4; zygomatic breadth 14; interorbital constriction 3.6; occipital breadth 11.2; occipital depth (median) 5.4; palatal depth 6.8; nasal 6.2; diastema 6.4; mandible 14.8; maxillary tooth-row 5.6; mandibular tooth-row 5.6.

*Specimens examined*.—Four, all from the type locality.

*Pitymys ibericus centralis*, subsp. n.

*Type*.—Adult male (skin and skull). Collected at Santo Domingo de Silos, Province of Burgos, Spain (altitude 980 m.), October 15, 1906, by G. S. Miller. Original number 7313.

*Characters*.—Not so large as *Pitymys ibericus ibericus* (hind foot 16 to 17.2 mm. instead of 17 to 18 mm); colour hair-brown, usually tinged with buffy, but never so pale as in the typical race; feet whitish, in rather noticeable contrast with back.

*Measurements*.—Type. Head and body 102 mm.; tail 24; hind foot 16.8; ear from meatus 8. Skull: condylo-basal length 25; zygomatic breadth 15 (ca.); interorbital breadth 4.2; occipital breadth 12; occipital depth 7.0; palatal depth 8.0; nasal 7.0; diastema 8.4; mandible 17.2; maxillary tooth-row 6.0; mandibular tooth-row 6.2.

*Specimens examined*.—Twenty, all from the type locality.

*Remarks*.—True *Pitymys ibericus* is a large pallid form, probably confined to the hot coast district of Murcia and Alicante. It is strikingly different from the small Granada animal, its nearest geographical ally, as well as from specimens from Jerez de la Frontera, Seville, Valencia, and Burgos. It is probable that more than one race is represented among the members of this group occurring through Central and North-western Spain.

*Pitymys ibericus regulus*, subsp. n.

*Type*.—Adult female (skin and skull). Collected on north slope of the Alhambra Hill, Granada, Spain, December 22, 1906, by G. S. Miller. Original number 7441.

*Characters*.—Similar to *Pitymys ibericus centralis*, but smaller (hind foot 15 to 16 mm. instead of 16 to 17.2 mm.), and with very small, narrow molars.

*Measurements*.—Type. Head and body 100 mm.; tail 26; hind foot 16; ear from meatus 9. Skull: condylo-basal length 25; zygomatic breadth 15; interorbital constriction 4.0; occipital breadth 12; occipital depth 6.2; palatal depth 8.0; nasal 6.4; diastema 8.0; mandible 16.6; maxillary tooth-row 5.4; mandibular tooth-row 5.4.

*Specimens examined*.—Seven, all taken in the almond orchard on north slope of the Alhambra hill.

*Remarks*.—This local race of *Pitymys ibericus* is at once recognizable by its unusually small molars, the actual structure of which, however, shows no peculiarities. In size of teeth it represents the opposite extreme from the large form occurring in the valley of the Baul, only about 70 km. east of Granada, and also in the Guadalquivir drainage-basin.

*Pitymys ibericus fuscus*, subsp. n.

*Type*.—Adult male (skin and skull). Collected on the Dehesa de Valencia, Valencia, Spain, March 7, 1907, by Norberto Gonzalez. Original number 131.

*Characters*.—Size as in *Pitymys ibericus centralis*, but colour much darker (upperparts a uniform bister, nearly as dark as that of Ridgway, faintly varied by blackish hair-tips and tinged with wood-brown on sides; underparts dull slaty grey washed with buffy; feet whitish, in rather marked contrast with body; tail very obscurely bicolor, whitish tinged above with brown).

*Measurements*.—Type. Head and body 104 mm.; tail 22; hind foot 17; ear from meatus 10. Skull: condylo-basal length 24.2; zygomatic breadth 14.8; interorbital constriction 4.2; occipital breadth 11.4; occipital depth 6.4; palatal depth 7.6; nasal 6.0; diastema 8.0; mandible 16.4; maxillary tooth-row 5.8; mandibular tooth-row 5.8.

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—The two specimens exactly resemble each other and differ conspicuously from all the other Spanish skins examined. Apparently this form is confined to the Dehesa, as in a male taken by Mr. Gonzalez at Catarroja on the adjacent mainland the colour is indistinguishable from that of *P. ibericus centralis*.